

CLAIMS

What is claimed is:

1. A positioning system comprising,
at least one mount for mounting a projection unit, the projection unit comprised of at least a projector for projecting a distorted image; wherein the at least one mount is coupled to a mechanism for providing translational movement and rotational movement for adjusting one of a position and an orientation of the projection unit to produce from the distorted image a substantially undistorted image on a surface.
2. The positioning system as in claim 1, wherein the projection unit comprises a redirection device.
3. The positioning system as in claim 2, wherein the redirection device comprises a mirror.
4. The positioning system as in claim 2, wherein the redirection device comprises at least one of a lens, an optical fiber and a prism.
5. The positioning system as in claim 1, wherein the at least one projector is coupled to a controller for generating the distorted image
6. The positioning system as in claim 5, wherein the controller comprises one of a remote controller, a controller integrated with the projection unit and a controller mounted with the projection unit.
7. The positioning system as in claim 1, wherein one of the distorted image and the substantially undistorted image comprise an interactive region for a user interaction.

8. The positioning system as in claim 7, wherein the user interaction comprises an instruction for operation of external equipment.
9. The positioning system as in claim 1, wherein one of the mount and at least another mount is adapted for mounting an interaction recognition system.
10. The positioning system as in claim 1, wherein the projection unit comprises an interaction recognition system.
11. The positioning system as in claim 9, wherein the interaction recognition system comprises apparatus for detecting a user interaction.
12. The positioning system as in claim 9, wherein the interaction recognition system comprises at least one camera.
13. The positioning system as in claim 9, wherein the interaction recognition system comprises a voice recognition system.
14. The positioning system as in claim 1, wherein the mechanism comprises at least one of a rotational mechanism and a translational mechanism.
15. The positioning system as in claim 1, wherein the mechanism is comprised of at least one of a telescoping mount, a scissors lift, an articulating arm, a kinematic device and a rail system.
16. The positioning system as in claim 1, wherein the mechanism is adapted for attaching to a fixed support.
17. The positioning system as in claim 1, comprising a positioning controller for controlling the position of the at least one projector.

18. The positioning system as in claim 17, wherein the positioning controller comprises a source of geometric model information.
19. The positioning system as in claim 1, comprising tracking and sensing equipment for identifying a position for the at least one projector.
20. The positioning system as in claim 1, wherein the system is adapted for positioning the at least one projector with two degrees of freedom.
21. The positioning system as in claim 1, wherein the system is adapted for positioning the at least one projector with three degrees of freedom.
22. The positioning system as in claim 1, wherein the system is adapted for orienting the at least one projector with two degrees of freedom.
23. The positioning system as in claim 1, wherein the system is adapted for orienting the at least one projector with three degrees of freedom.
24. A method for providing a substantially undistorted image upon a surface, the method comprising:
 - sensing a request from a user for a projection at a location;
 - selecting a projection unit comprised of at least a projector for projecting a distorted image; and,
 - moving the at least one projector by operating a mechanism comprising the at least one projector mounted on a moveable portion of the mechanism, wherein the mechanism is adapted for providing translational movement and rotational movement of the at least one projector to provide the substantially undistorted image upon the surface at the location.

25. The method as in claim 24, wherein sensing comprises identifying a request from at least one of equipment for automatically entering the request and equipment for manually entering the request.
26. The method as in claim 24, wherein operating the mechanism comprises one of manually operating the mechanism and automatically operating the mechanism.
27. The method as in claim 24, wherein positioning comprises locating the projection unit to provide for an image substantially free from occlusion.
28. The method as in claim 24, comprising coordinating position of the at least one projector with a position of at least an interaction recognition system.
29. The method as in claim 24, comprising coordinating the position of the at least one projector with a position of at least another projector.
30. The method as in claim 29, wherein the projection unit produces a first portion of the distorted image and the at least another projection unit produces another portion of the distorted image.
31. A method for calibrating a positioning system for a projection unit comprised of at least a projector adapted for projecting a distorted image, the positioning system for providing a substantially undistorted image to a user, the method comprising:
 - loading a calibration image into the at least one projector;
 - moving the at least one projector to a location to project the calibration image upon a target surface;
 - adjusting settings of the at least one projector to produce a calibration image that is substantially undistorted upon the target surface;
 - recording the settings for the at least one projector at the location;
 - associating the settings with the target surface to produce a set of geometric model data;

storing the set of geometric model data; and,
repeating the loading, moving, adjusting, recording, associating and storing for a plurality of positions of the at least one projector.

32. A method to provide a substantially undistorted image upon a surface at a location, the method comprising:

providing a projection unit coupled to a positioning system, the projection unit comprised of at least a projector for providing an image;

loading setting layout information into a positioning controller for operating the positioning system;

positioning the at least one projector at a location by referring to the setting layout information;

referring to the setting layout information to determine projection settings for the at least one projector; and,

adjusting the settings of the at least one projector to the projection settings to produce the image upon the surface.

33. A method for adjusting at least one input setting of an interaction recognition system coupled to a positioning system, the method comprising:

providing a positioning system comprising at least one mount adapted for mounting a projection unit and at least one other mount for positioning the interaction recognition system, wherein the interaction recognition system provides for a user input in response to an image projected by the projection unit;

loading area layout information into a positioning controller for operating the positioning system;

positioning the interaction recognition system at a location by referring to the area layout information;

referring to the area layout information to optimize the at least one input setting for the interaction recognition system; and,

adjusting the at least one input setting of the interaction recognition system.

34. A computer program stored on a computer readable media, the program comprising instructions for positioning a projection unit to produce a substantially undistorted image, the instructions for:

sensing a request from a user for production of an image at a location;

positioning the projection unit to provide the substantially undistorted image upon a surface at the location, wherein positioning comprises referring to a stored geometric model for the location to produce the substantially undistorted image in accordance with the geometric model.

35. A positioning system, comprising:

mounting means for mounting a projection means comprised of at least an image projecting means for projecting a distorted image; wherein the mounting means is coupled to positioning means for providing translational movement and rotational movement of the projection means to produce a substantially undistorted image from the distorted image.

36. The positioning system as in claim 35, wherein the positioning means comprises means for moving the image projecting means through a range of movement comprising between two degrees of freedom and six degrees of freedom.

37. A projection system, comprising:

at least one projection unit comprised of at least a projector for projecting a distorted image, the at least one projector mounted to at least one mount that is coupled to a mechanism providing translational movement and rotational movement for positioning the at least one projector to produce a substantially undistorted image from the distorted image.

38. The projection system as in claim 37, wherein the projection unit comprises a controller for generating the distorted image coupled to the at least one projector.

39. The projection system as in claim 37, wherein one of the substantially undistorted image and the distorted image comprises an interactive region.
40. An image projection system comprising a controller coupled to a positioning apparatus for positioning a projection unit in three-dimensional space, the system for producing a substantially undistorted image at a specified location, the controller being responsive to stored geometric model for the location to cause the projection unit to provide the substantially undistorted image.